

and Dr. Parikshit Gaumtam & Dr. S.K. Behera (WWF-India) is highly appreciated. The first author acknowledges the

Council of Scientific and Industrial Research (HRD Group), New Delhi for awarding a research grant.

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## 11. REDESCRIPTION OF *GARRA ABHOYAI* HORA (TELEOSTEI: CYPRINIDAE: GARRINAE) WITH A NOTE ON *GARRA RUPECULA* FROM MANIPUR, INDIA<sup>1</sup>

W. VISHWANATH<sup>2,3</sup> AND I. LINTHOINGAMBI<sup>2,4</sup>

<sup>1</sup>Accepted May 10, 2007

<sup>2</sup>Department of Life Sciences, Manipur University, Canchipur 795 003, Manipur, India.

<sup>3</sup>Email: wvnath54@yahoo.com, wvnath@gmail.com

<sup>4</sup>Email: ilinthoi@yahoo.com

### Introduction:

Fishes of the genus *Garra* Hamilton inhabit bottoms of fast flowing streams and are widely distributed from southern China, across South-east Asia, India and the Middle East to northern and central Africa (Kullander and Fang 2004). The genus is characteristic in having its mouth and its posterior region highly modified into a suctorial disc, also called mental disc.

McClelland (1839) described *Gonorhynchus rupeculus* from Mishmi Hills, Arunachal Pradesh (Brahmaputra basin), India. Gunther (1868) and Day (1878) considered the species a synonym of *Discognathus lamta* (Hamilton). Hora (1921) described *Garra abhoyai* from the streams of Ukhrul district of Manipur (Chindwin basin). Menon (1964), while revising the genus, considered McClelland's (1839) species as valid and redescribed it as *Garra rupecula*, based on specimens only from Chindwin basin in Manipur, an entirely different basin from the type locality. He also considered *Garra abhoyai*, a synonym of *Gonorhynchus rupecula*. Vishwanath (1993) and Vishwanath and Joyshree (2005) also followed earlier literature in treating the validity of *Garra rupecula* of Manipur.

In the present study, several specimens of *Garra*, confirming the description of Hora's (1921) *G. abhoyai* were collected from the hill streams in the Ukhrul and Imphal west districts of the State. The species is considered valid and redescribed here. The status of *G. rupecula* of Manipur is also discussed.

Measurements and counts follow Kullander and Fang

(2004), and that of head depth follow Menon (1964). Scale counts follow Kottelat (2001). Specimens examined for the study are deposited in the Manipur University Museum of Fishes (MUMF). Number in parentheses after a particular count indicates number of specimens examined.

### *Garra abhoyai* Hora

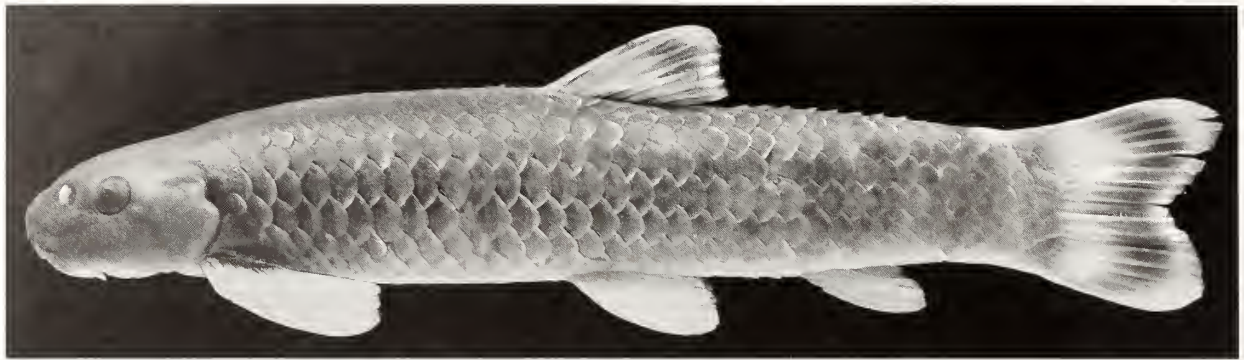
(Figs 1-3)

*Garra abhoyai* Hora 1921: 664 (type locality Naga Hills, Ukhrul district, Manipur).

**Material Examined:** MUMF 6296-6305, 10, 49.3-54.90 mm SL, Iiril R. at Phungdhar, Manipur, 17.i.2003, K. Nebeshwar, M. Shantakumar and I. Linthoingambi, MUMF 8048-8054 and 8103-8112, 17, 45.0-53.0 mm SL, Nambul R. at Singda, Manipur, 3.xi. 2005, H. Joyshree.

**Diagnosis:** A small species of *Garra* with smoothly rounded snout tip; rostral lobe absent; proboscis absent; predorsal scales present but those towards head very reduced, irregularly arranged and covered by mucus almost making it appear to be absent; chest and abdominal region naked, however, area just in front of pelvic fin scales covered by mucus; papilliferous tissue absent along the upper jaw; papillations present at an angle of upper and lower lip; lateral line scales 30-33 + 1-3.

**Description:** General appearance as in Fig. 1. Table 1 presents morphometric data. Body small, maximum standard length 58.7 mm, elongated, predorsal contour straight; body depth almost uniform; ventral aspect flattened from head to anal fin base; snout rounded without transverse groove,

Fig. 1: Lateral view of *Garra abhoyai*

proboscis absent; rostral lobe absent; head wider than deep, orbit in mid HL. Anterior barbel not reaching margin of rostral cap. Central pad oval shaped, wider than long. No papilliferous tissue along the upper jaw. Papillations present at an angle of upper and lower lip. Caudal peduncle short almost as deep as long.

**Fins:** Dorsal fin origin equidistant between anterior margin of eye and caudal fin base, posterior margin straight, bearing ii, 6, i rays, posterior end at same level with that of pelvic fin. Pectoral fin with round posterior margin, bearing i, 13 rays, fourth branched ray longest extending halfway the distance between its anterior base and pelvic fin. Pelvic fin origin at vertical level of 2<sup>nd</sup> branched ray of dorsal fin, round posterior margin, bearing i, 7, i rays, 2<sup>nd</sup> and 3<sup>rd</sup> branched ray

longest, fin extending to vent. Anal fin short but extends beyond mid of caudal peduncle, straight posterior margin, bearing ii, 4, i rays. Caudal fin emarginated, bearing 9+8 rays.

**Scales:** Predorsal region appears to be naked due to thick mucous cover (Fig. 3a). On scraping, it is observed that scale boundaries are not well distinguished, becoming much reduced and irregularly arranged (Fig. 3b). Chest and abdominal region naked, however area just in front of pelvic fin has scales covered by mucus (Fig. 2). Scales behind dorsal fin up to caudal fin base distinct with well defined margins, 11-14 [11(5), 12(6), 13(8), 14(8)] in number. However, in larger specimens 45.7 mm SL onwards, scales just behind dorsal fin tend to be reduced and irregularly arranged. Lateral line 30-33 + 1-3, i.e. 30(4), 32(7), 33(16) + 1(5), 2(17), 3(5). Scales between dorsal fin base and lateral line  $\frac{1}{2}$  4 and that between lateral line and pelvic fin base  $4\frac{1}{2}$ . Circumpeduncular scales 16.

**Colour:** Greenish brown on back, paler ventrally. Dorsal fin with a submarginal black band, band present only on the rays. Caudal fin with a distinct W-shaped black band.

**Distribution:** INDIA: Manipur: Iril R., Nambul R. (Chindwin Basin).

**Discussion:** Specimens of *Garra* from Iril and Nambul rivers under study agree with the original description of *G. abhoyai* Hora. In the identification of *Garra* spp., lepidosis has been considered as an important character. Hora (1921) reported that in the above species, the scales on the sides and postdorsal region were well marked while those in front of the dorsal were reduced and appeared to be almost devoid of scales to the naked eye. Similar observations were also made in the present study.

*Garra abhoyai* is distinguished from *G. lissorhynchus* in having the angle of upper and lower lips papillated vs. ridged; predorsal scales reduced and irregular vs. well defined; scales between lateral line and pelvic fin base  $\frac{1}{2}$  4 vs.  $\frac{1}{2}$  3; anal fin rays ii, 4, i vs. i, 4.

McClelland (1839) described *Gonorhynchus rupeculus* from Mishmi Hills, Arunachal Pradesh (Brahmaputra basin), India. Gunther (1868) and Day (1878) considered the species

Table 1: Morphometric data of *Garra abhoyai* Hora

Characters	Mean	Range	S.D.
Standard length (mm)		39.1-58.7	
<b>Percentage Standard length</b>			
Body depth (at dorsal)	18.2	17.6-18.7	0.4
Body depth (at anal)	16.0	15.6-16.7	0.3
Head length	22.7	22.0-23.5	0.5
Body width (at dorsal)	16.1	15.6-17.1	0.6
Caudal peduncle length	14.7	13.5-16.0	1.0
Dorsal fin length	12.3	11.5-14.2	0.9
Pectoral fin length	20.6	20.0-21.5	0.6
Pelvic fin length	17.0	16.2-18.0	0.6
Anal fin length	06.9	06.3-08.1	0.6
Predorsal length	53.7	51.4-55.0	1.2
Prepelvic length	56.8	54.4-59.0	1.6
Preanal length	79.8	78.0-81.2	1.3
<b>Percentage Head length</b>			
Head depth at nape	59.4	57.0-64.1	2.1
Head depth at eye	49.5	48.0-55.3	2.0
Head width at occiput	80.2	78.0-83.0	1.9
Snout length	45.5	44.0-48.0	2.3
Eye diameter	19.3	17.3-20.4	1.4
Interorbital width	52.2	49.2-56.0	2.5
Internarial space	40.3	38.3-42.0	1.5
Disc length	35.5	33.0-38.1	2.2
Disc length% its width	73.0	70.5-76.2	2.3
Central pad length% its width	71.7	69.4-75.0	2.5

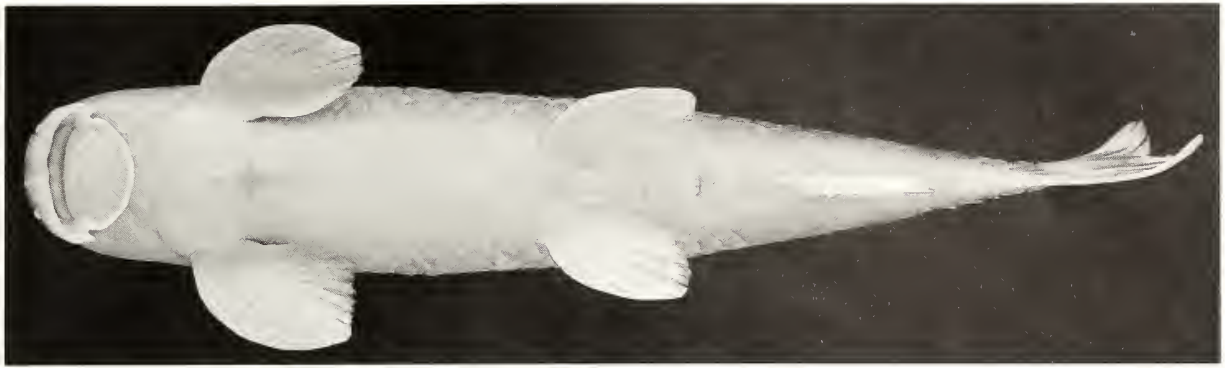


Fig. 2: Ventral view of *Garra abhoyai*

a synonym of *Garra lamta* (Hamilton), a species with no wavy or W-shaped black bar across the caudal fin. The species does not occur in Chindwin basin. Hora (1921) considered McClelland's species as *Garra rupeculus* based on examination of specimens of maximum 2 inches length from the hill streams of Manipur valley (Chindwin basin), an entirely different drainage from the type locality. The important characters he observed in the fish are: a light black streak near the free margin of the dorsal, a deep black bar across the base of dorsal and a wavy band in the middle of caudal fin; rows of open pores on snout extending to lateral line; origin of dorsal slightly nearer to caudal base than to tip of snout; ventral fin extends beyond anus and ventral surface naked.

*G. abhoyai* can be easily distinguished from *G. rupecula* in having clear W-shaped black band marking on the caudal fin (Hora 1921). Thus, *G. abhoyai* is resurrected from the synonymy of *G. rupecula*.

Hora's (1921) *Garra rupecula* from Manipur shares similar characters with *G. nambulica* Vishwanath and Joysree (2005) in having open pores on snout continuing with lateral line, black bands across dorsal and caudal fins, and absence of scales on ventral surface. It is also similar to *G. paralissorhynchus* Vishwanath and Shanta (2005) in having similar types of colour bands on dorsal and caudal fins also. His descriptions were based probably on a mixture of small specimens (29.7-34.4 mm TL) of both the latter two species.



Fig. 3: Dorsal view of *Garra abhoyai*:

a. showing mucous covered predorsal region; b. predorsal region after scrapping mucous

Decisions in fish taxonomy of earlier days were often based on a few samples of very dissimilar sizes and poorly preserved as a result of the logistical problems and difficult technical conditions of field work at that time. Authors often observed variability, but the available material did not allow them to conclude whether the variability was ontogenic, geographic, intra- or interspecific; and with the then prevailing species concepts it was usually conservatively concluded for intraspecific variability (Ng and Kottelat 2000).

The present concept is that fresh water fishes are distributed in a particular river basin and their congeners

in an entirely separated different basin are proved to be different species. Various revisional studies of 'such highly variable' and widely distributed forms of earlier days have now shown to be aggregates of distinct, often not even closely related species (Kottelat and Lim 1993; Kottelat 1996; Roberts and Ferraris 1998; Ferraris and Runge 1999; Ng and Kottelat 2000; Ng 2003; Chakrabarty and Ng 2005).

Thus, the distribution of *Garra rupecula* in the Chindwin basin of Manipur may be considered invalid with the validation of *G. abhoyai*.

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## 12. NATURAL HISTORY AND EARLY STAGES OF THE WESTERN GHATS ENDEMIC GOLDEN FLITTER *QUEDARA BASIFLAVA* (HESPERIIDAE, LEPIDOPTERA) FROM SOUTH-WESTERN INDIA<sup>1</sup>

KRUSHNAMEGH KUNTE<sup>2</sup>

<sup>1</sup>Accepted November 07, 2006

<sup>2</sup>University of Texas at Austin, Section of Integrative Biology, 1 University Station C 0930, Austin, Texas 78712-0253, USA. Email: krushnamegh@mail.utexas.edu

The genus *Quedara* Swinhoe, 1919 (Family HesperIIDae, Lepidoptera) has five species, which are distributed from southern India to Borneo and Sumatra in South-east Asia. The genus is represented by a single species

in the Western Ghats, south-western India: the Golden Flitter *Quedara* (= *Hyarotis*) *basiflava* de Nicéville. The genus is allied to *Hyarotis*, which has two representatives in the Western Ghats: the Tree Flitter *H. adrastus* Stoll and the Brush